

REMARKS

The present amendment is responsive to the Office Action mailed in the above-referenced case on July 16, 2002. Claims 1-32 are presented for examination. The Examiner has objected to claims 1, 10, 22 and 24 due to informalities, and has rejected claims 1, 8, 16, 19, 22 and 25 under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1-3, 7-10 and 12-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Harriman. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman in view of Baumgartner (5,138,614), hereinafter Baumgartner. Claims 4-5, 11, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman in view of Chao (5,724,351), hereinafter Chao. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman in view of Chao, and further in view of Teraslinna (4,991,171), hereinafter Teraslinna.

Applicant has carefully reviewed the Examiner's statements and rejections in the instant Office Action, and the prior art cited and applied by the Examiner. Regarding the Examiner's objection to applicant's claims due to informalities, applicant herein amends claims 10, 24, and 22 to correct the typographical errors, and herein provides clarification below regarding applicant's claim 1, which clearly overcomes the objection.

Regarding the Examiner's 112 rejection of applicant's claims, applicant herein further amends the claims to more particularly point out and distinctly claim the subject matter which applicant regards as the invention, and provides to the Examiner further clarification from applicant specification which will clarify to the Examiner the meaning of applicant's limitations as recited in the claims. Said amendments to claims addressing the Examiner's 112 rejection of the claims, and the above objection to the claims for informalities, are detailed in the markups section of this response.

Regarding the Examiner's merit rejections of applicant's claims, applicant herein provides arguments which will clearly show that not all of applicant's limitations as recited in applicant's claims are taught or suggested in the combination of the primary reference of Harriman with the various other references presented by the Examiner. Applicant argues that the primary reference of Harriman fails to support grounds for a prima facie rejection, and also fails as a proper primary reference for combining to read on applicant's claims.

The Examiner states in paragraph 1, page 2 of the instant Office Action, that in applicant's claim 1, line 10, "egress" should be changed to "ingress", and in line 11, "ingress" should be changed to "egress". It is clear to applicant by the Examiner's statement that the Examiner misinterprets the characterization of the limitations in applicant's claim. Applicant wishes to clarify to the Examiner the true meaning of the characterization in question, by directing the Examiner's attention to applicant's Fig. 4 and description of the embodiment presented in applicant's specification.

Applicant's claim 1 clearly recites that "data packets assigned for multicasting arrive at the port on the egress path and are diverted to the multicast-capable component, wherein the packets are replicated or re-addressed and output to the ingress path". Referring now to Fig. 4, fabric card 321 is shown to have a multiplicity of ports, which are enabled for both ingress and egress. One or more of the ports are enabled for multicasting. M-port 325 is one of a plurality of such multicast capable ports in the embodiment presented. Data packets assigned for multicasting arrive at M-port 325 for replication and readdressing from the crossbar switching facility 327 following the egress path ("arrive at the port on the egress path"), are then replicated and/or readdressed by multicast circuitry within the circuitry of M-port 325, and the replicated packets (ABCD) are output from M-port 325 back into the crossbar switching facility 327 and ultimately to the virtual output queue (VOQ 329) which, as is clearly shown in the figure and described in

applicant's specification to be on the ingress path ("output to the ingress path").

The Examiner has rejected claims 1, 8, 16, 19, 22 and 25 under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that, regarding applicant's method claim 25, it is not clear what is meant by "the multicast engine is integrated into the circuitry one of the port of the fabric card", and further, that there is insufficient antecedent basis for the limitation. The Examiner further states that claim 25 is vague and indefinite because it is not sure if "the circuitry" on line 1 is referred to circuitry on line 3 of claim 24.

Page 6, lines 11-13 of applicant's specification, it is clearly described that the multicast engine of applicant's invention is provided as the replicating component of port 325, and may be implemented with basic logic circuitry as an integrated part of the circuitry of multicast port 325, or as separate circuitry outside of the port circuitry in some embodiments. Applicant herein amends the language of claim 25 to recite "multicast engine circuitry is integrated into the circuitry of one of the ports of the fabric card".

Applicant clarifies to the Examiner that claims 24 and 25 as amended recite an embodiment of applicant's invention wherein the multicast-capable data router of claim 24 comprises a multicast engine and ports, which may be implemented as circuitry, and the multicast circuitry may be integrated with the circuitry of the one or more multicast-capable ports of the fabric card.

Regarding claim 22, the Examiner states that there is insufficient antecedent basis for "the multicast-capable component" recited in line 1 of applicant's claim. Applicant herein amends the language of claim 22 to clearly recite "wherein the multicast engine is integrated into the circuitry of one of the ports of the fabric card".

Regarding claim 16, the Examiner states that lines 7-9 of applicant's claim cause the claim to be vague and indefinite, adding that if the multicast data packets are diverted to the multicast-capable component then the data packets input to the multicast-capable component have not been replicated yet

because the data packets are being diverted, not replicated. Applicant herein amends the language of claim 16 to recite a "multicast-capable component for replicating data packets and re-addressing the replicated data packets.

Applicant wishes to clarify to the Examiner that it is true that the multicast data packets arriving at the port of applicant's claim 16, have not yet been replicated. The multicast data packets are data packets assigned for multicasting, and are therefore diverted to the multicast-capable component for replication or re-addressing. As is recited in page 14, lines 14-27 of applicant's specification, with reference to applicant's Fig. 4, re-addressing of the multicast data packets by the multicast-capable component is a process of the replication of the data packets.

Regarding claim 1, the Examiner apparently does not understand the characterization of applicant's claim as it relates to the multicast-capable port comprising an ingress for receiving data packets and egress for outputting data packets. Applicant now wishes to direct the Examiner to Fig. 5 of applicant's specification, where it is clearly illustrated that that the multicast-capable port 325 is enabled for ingress and egress, the ingress of the multicast-capable port for receiving data packets from the crossbar (incoming packets along egress path) and diverting data packets assigned for multicasting to multicast engine 339 for replication or readdressing. Replicated data packets are addressed in the replication process for output back to the crossbar (output packets along ingress path) to the next destination. The functions of ingress and egress of multicast port 325 do not interchange, but cooperate in function to enable replication, readdressing and output of the replicated data packets along the ingress path to virtual output queue (VOQ 329) of applicant's Fig. 4.

The Examiner has rejected applicant's claims 1-3, 7-10 and 12-26 as being anticipated by Harriman. The Examiner states that, regarding claim 1, Harriman discloses the multicast-capable port of applicant's invention for replicating multicast data packets, referring to element 110 of Harriman. Applicant respectfully points out to the Examiner, however, that element 110

of Harriman is not a port at all, and therefore cannot read on applicant's claimed limitation of a multicast-capable port. Specifically, referring now to Fig. 1, col. 3, lines 46-48 of Harriman, element 110 is taught to be a shared-memory switching fabric surface for transferring information among input and output ports and a central processing unit. There is no teaching whatsoever in Harriman of port circuitry enabled for multicasting as claimed by applicant. Further to the above, applicant argues that Harriman nowhere teaches or suggests anything having to do with diverting data packets assigned for multicasting which arrive at the port on the egress path, or outputting replicated data packets back into the crossbar along the ingress data path.

Applicant, however, wishes to clarify to the Examiner that the multicast-capable port of applicant's claim 1 is one or more of a plurality of multicast-capable ports in a fabric card having multiple ports. In order to more distinctly claim the subject matter, applicant herein amends the language of claim 1, without departing from the scope of claim, to recite one or more multicast-capable ports in a fabric card having multiple ports. Said amendment is detailed in the markups section of this response.

Applicant argues that a fundamental distinction exists between the system of Harriman and that of applicant's claimed invention. Specifically, Harriman teaches a switching fabric having input ports 102 for receiving data packets into the fabric, output ports 104 for outputting data packets out of the fabric, and a multicast engine in the fabric for replicating and readdressing data packets assigned for multicast. Applicant's invention, however, is uniquely distinct from Harriman in that the circuitry of one or more of the multiple ingress/egress ports of the fabric card contains circuitry which enables multicasting, and the multicast-capability of the one or more ports may be activated or de-activated depending on the demand for multicasting. Additional multicasting capability may also be implemented in other port circuitry in other multicast-capable fabric cards, and an entire matrix of multicast-capable fabric cards such as claimed by applicant may be mapped

and managed, thereby providing a method for effective and economical scalability of multicast capability to consistently meet fluctuating demand on the system for data packet multicasting.

The Examiner states that, regarding applicant's claim 2, Harriman discloses that the port 110 is hosted on a card 110 within a data router 100. Applicant again respectfully points out to the Examiner that element 110 of Harriman is not a port at all; rather, element 110 is a switching fabric circuit hosted by a network switch 100. Applicant cannot see how the Examiner can interpret element 110 of Harriman as both a port and a card, when it is clearly taught to be a switching fabric circuit.

Applicant believes claim 1 as amended and argued above is clearly and unarguably patentable over the art of Harriman, because as argued by applicant, Harriman fails to disclose a fabric card having multiple ports, one or more of which are multicast-capable ports, characterized in that data packets assigned for multicasting arrive at the port on the egress path and diverted to a multicast-capable component, wherein the packets are replicated or re-addressed and output to the ingress path.

The Examiner rejects claim 6 as being unpatentable over Harriman in view of Baumgartner, claims 4-5, 11, and 27-31 as being unpatentable over Harriman in view of Chao, and claim 32 as being unpatentable over Harriman in view of Chao, and further in view of Teraslinna. The Examiner cites Harriman as the primary reference in all of the above combinations. In view of applicant's above argument that Harriman does not teach all of the limitations of applicant's claim 1, and is therefore not a proper primary reference for rejecting applicant's claims, applicant believes that the combination of Harriman with any or all of the additional references cannot produce all of the limitations of applicant's claim 1.

Applicant's base claims 10, 15, 16, 21, 24, and 27 recite a fabric card, multicast engine, multicast-capable data routers and method for multicasting in accordance applicant's claim 1, and are therefore also patentable as argued

above by applicant on behalf of claim 1, or as amended to overcome the Examiner's above objections to the claims for informalities. Depending claims 2-9, 11-14, 17-20, 22-23, 25, 26, and 28-32 are then patentable on their own merits, or at least as depended from a patentable claim.

As all of the claims have been clearly shown as amended and argued above to be patentable over the prior art presented, applicant respectfully requests that applicant's above claims be reconsidered, the rejections are withdrawn and that the case be passed quickly to issue. If any fees are due beyond fees paid with this amendment, authorization is made to deduct those fees from deposit account 50-0534. If any time extension is needed beyond any extension requested with this amendment, such extension is hereby requested.

Version With Markings to Show Changes Made

In the claims.

1. (Once Amended) [A] In a fabric card having multiple ports, one or more multicast-capable [port] ports for replicating multicast data packets comprising:

at least one ingress path into the port for receiving the data packets;
at least one egress path out of the port for outputting data packets; and
a multicast-capable component coupled to the egress and ingress paths of the port, the multicast-capable component for replicating and readdressing the replicated data packets;

characterized in that data packets assigned for multicasting arrive at the port on the egress path and are diverted to the multicast-capable component, wherein the packets are replicated or re-addressed and output to the ingress path.

10. (Once Amended) A multicast-capable fabric card within a data router comprising[:] :

at least two ports coupled to each other by data paths; and
at least one multicast engine;

characterized in that data packets assigned for multicasting arrive at the multicast-capable fabric card and are delivered to the multicast engine wherein they are replicated and/or modified as needed for multicast and forwarded.

16. (Once Amended) A multicast-capable data router having a multicast-capable port for replicating multicast data packets, the port having at least one ingress path into the port for receiving the data packets, at least one egress

path out of the port for outputting data packets, and a multicast-capable component coupled to the egress and ingress paths of the port, the multicast-capable component for replicating data packets and re-addressing the replicated data packets;

characterized in that data packets assigned for multicasting arrive at the port and are diverted to the multicast-capable component, wherein the packets are replicated or re-addressed and forwarded.

19. (Once Amended) The router of claim 16 wherein the multicast-capable port is [an external port] the port of a fabric card external to the router.

21. (Once Amended) A multicast-capable data router having a fabric card comprising circuitry for at least two ports coupled to each other by data paths, and at least one multicast engine;

characterized in that data packets assigned for multicasting arrive at the fabric card and are delivered to the multicast engine wherein they are replicated and/or modified as needed for multicast and forwarded.

22. (Once Amended) The router of claim 21 wherein the [multicast-capable component] multicast engine is integrated into the circuitry of the one of the ports of the [multicast-capable] fabric card.

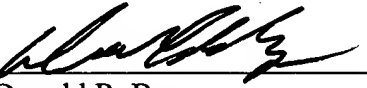
24. (Once Amended) A multicast-capable data router, comprising circuitry for a multicast engine and having one or more first ports for communicating with one or more second ports of one or more fabric cards, and port circuitry for modifying or replicating multicast packets routed to the engine[:];

characterized in that multicast packets received from the one or more fabric cards are replicated and/or modified as needed, and forwarded via one or more of the first ports to one or more of the second ports.

25. (Once Amended) The router of claim 24 wherein the circuitry of the multicast engine is integrated into the circuitry of one of the ports of the fabric card.

Respectfully Submitted,

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